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ABSTRACT

The impact of using integrated metacognitive instruction on high school students' achievement, self-efficacy, and test anxiety was studied. Forty students in 2 advanced geography classes in a large suburban high school participated. The level of metacognitive strategies students used at the beginning of the semester was assessed and compared to that of the end of the semester, and these levels were compared to those of a control group. The Motivated Strategies for Learning Questionnaire (MSLQ) was used to measure metacognitive strategy use, self-efficacy for learning, and test anxiety. It was hypothesized that the treatment group would have higher scores on an achievement test, that they would report higher self-efficacy scores, and that they would also report lower test anxiety scores. Treatment effects were in the direction that was hypothesized, but there were no significant differences between the two groups, a result that may be attributed to the small sample size. Significant interactions were found between gender and achievement, metacognitive self-regulation, and test anxiety. Males had higher achievement scores, and females reported higher levels of metacognitive strategy use and higher levels of test anxiety. Attachments include lesson plans, the MSLQ, and forms used to conduct the study. (SLD)

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Running head: METACOGNITION, SELF-EFFICACY, ACHIEVEMENT, AND GENDER

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An Analysis of the Effects of Integrated Instruction of Metacognitive and Study Skills Upon the Self-Efficacy and Achievement of Male and Female Students

Research Project

Presented to the Department of Educational Psychology

in Partial Fulfillment of the Requirements

for the Master of Education Degree

by

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ABSTRACT

The purpose of this research project was to examine the impact of employing integrated metacognitive instruction on high school students' achievement, self-efficacy, and test anxiety. Although data exists concerning the effectiveness of such instruction at the collegiate level, empirical support for such instruction was lacking at the high school level. Therefore, this study was conducted in two advanced geography classes at a large suburban high school of approximately 2,000 students in which the project investigator serves as an instructor. The students ranged from fifteen to seventeen years in age, and contained a mix of both males and females, as well as a fairly diverse ethnic background. A total of 40 students were included in the study. The project investigator assessed the level of metacognitive strategies being used at the beginning of the semester as compared to the end of the semester, while focusing on a comparison between data collected between control and treatment groups. The measurements of metacognitive strategy usage, self-efficacy for learning, and test-anxiety were acquired via a testing device entitled the Motivated Strategies for Learning Questionnaire (MSLQ). The researcher hypothesized, first, that the treatment group would score higher than the control group on the achievement test. Second, the treatment group would report higher self-efficacy scores than the control group. Third, the treatment group would report lower test-anxiety scores than the control group. Concerning gender, it was also hypothesized that females would report higher levels of metacognitive strategy usage than males, while males would report higher self-efficacy scores than females. Although the treatment effects were on the direction that was expected an analysis of variance and covariance on the measures of these variables did not reveal any significant differences between the groups. This lack of significance

was attributed primarily to a lack of power based on the small sample size. However, significant interactions were discovered between gender and achievement, metacognitive self-regulation, and test-anxiety, where males scored higher achievement scores than females, while females reported higher levels of metacognitive strategy usage and higher levels of test-anxiety than males. The implications of this study support a call for more research to be conducted in this area, with particular attention being given to gender and sample size.

TABLE OF CONTENTS

Introduction 6

Literature Review 8

Definition of Key Terms 8

Role of Metacognition in Learning 9

Approaches to Metacognitive Instruction 9

Empirical Support for Metacognitive Instruction 11

Impact Upon Self-Efficacy 13

Other Related Factors 14

Method 17

Subjects 17

Materials 18

Procedures 19

Results 21

Discussion 28

Conclusion 34

References 35

Attachments 37

Lesson Plans 37

MSLQ 42

Permission Slip 45

Informed Consent Form 46

Achievement Test 47

Feedback Forms 57

List of Tables 5

Table 1: "Comparing Treatment Conditions and Gender Groups on Pre and Post Measures of Achievement, Metacognitive Self-Regulation, Test Anxiety, and Self-Efficacy" 22

List of Figures 5

Figure 1: Pre and Post Measures of Achievement 23

Figure 2: Pre and Post Measures of Metacognition 24

Figure 3: Pre and Post Measures of Test-Anxiety 24

Figure 4: Pre and Post Measures of Self-Efficacy 24

Figure 5: Comparing Achievement by Gender 25

Figure 6: Comparing Metacognition by Gender 26

Figure 7: Comparing Test-Anxiety by Gender 26

Figure 8: Comparing Self-Efficacy by Gender 27

INTRODUCTION

In recent years increasing attention has been focused on the role of metacognition and cognitive monitoring as a rationale for instruction of learning strategies. The rationale is that good teaching includes teaching students how to learn, remember, think and motivate themselves regardless of the age of the students or the discipline at hand. Norman (1980) summarizes this argument as follows:

> It is strange that we expect students to learn yet seldom teach them about learning. We expect students to solve problems yet seldom teach them about problem solving. And, similarly, we sometimes require students to remember a considerable body of material yet seldom teach them the art of memory. It is time we made up for this lack, time that we developed the applied disciplines of learning and problem solving and memory. We need to develop the general principles of how to learn, how to remember, how to solve problems, and then to develop applied courses, and then to establish the place of these methods in an academic curriculum. (p. 97)

It is all too true that a great deal of students, even at the collegiate level, are lacking in their repertoire of learning strategies and their use of metacognition. However, not all agree to the benefits of an attempt to directly instruct students upon how to think, or to even incorporate such objectives into the curriculum. de Bono (1983) has asserted that direct instruction is the only route to effective use of learning strategies. This approach also has the additional benefit of placing a higher level of emphasis on this subject. Bereiter (1984) has disagreed. Bereiter has asserted that the only successful approach to metacognitive instruction is one which is integrated within the entire curriculum, and therefore the entire thinking process of the student.

There is debate as to both the place and effectiveness of such objectives in the curriculum. This debate revolves around such issues as whether or not a student can be taught how to effectively employ thinking, learning, and study strategies. If so, how should that instruction take place, and what are some of the expected outcomes one

could anticipate from such students? The purpose of this research was to examine the impact of integrated metacognitive instruction on male and female high school students' achievement, self-efficacy for learning, and test-anxiety.

LITERATURE REVIEW

Definition of Key Concepts

The key concepts associated with this research were not always consistently defined in the field of education and psychology. Metacognition, for example, was defined in a range from the vague universal reference of the process of thinking about ones own thinking, to very particular definitions that included sub-tasks such as elaboration, rehearsal, imagery, comprehension monitoring, and active reading (McKeachie, Pintrich, & Lin, 1985). A middle ground was offered in the definition provided by Costa (1984) who described metacognition as "our ability to know what we know and what we don't know". (p. 57) This definition also included subprocesses such as planning a strategy for the task at hand, regulating the steps and strategies throughout problem solving, and reflecting and evaluating upon the effectiveness of the approach used.

Perhaps even this definition may be suitable, but it is imperative that all constructs be defined in a way that their definitions are valid in terms of their measurement. Therefore, the following definitions offered are in concordance with the definitions provided by the authors of the Motivated Strategies for Learning Questionnaire (MSLQ), the primary testing device employed. Here are the essential terms at hand defined according to Pintrich, McKeachie, Smith, Doljanac, Lin, Naveh-Benjamin, Crooks, and Karabenick (1987):

Metacognition refers to the awareness, knowledge, and control of cognition. There are three general processes that make up metacognitive self-regulatory activities: **planning**, **monitoring**, and **regulating**. **Planning** activities such as goal setting and task analysis help to activate, or prime, relevant aspect of prior knowledge that make organizing and comprehending the material easier. **Monitoring** activities include tracking one's attention as one reads, and self-testing and questioning: these assist the learner in understanding the material and integrating it with prior knowledge.

Regulating refers to the fine-tuning and continuous adjustment of one's cognitive activities. Regulating activities are assumed to improve performance by assisting learners in checking and correcting their behavior as they proceed on a task.

Self-efficacy is a self-appraisal of one's ability to master a task. Self-efficacy includes judgments about one's ability to accomplish a task as well as one's confidence in one's skills to perform that task.

Test anxiety is thought to have two components: a worry, or cognitive component, and an emotionality component. The worry component refers to students' negative thoughts that disrupt performance, while the emotionality component refers to affective and physiological arousal aspects of anxiety.

Role of Metacognition in Learning

Today there appears to be a near plethora of research concerning the underlying processes of the brain. The neuroscience and cognitive psychology models have somewhat merged to present fascinating new insights into how the brain functions, and how to use the brain more effectively. Some of the earlier cognitive research conducted by those like Flavell (1979) provided a foundation for the more recent inquiries into the importance of the role of metacognition and cognitive-monitoring in learning. While on the one hand his findings showed that young children were very limited in their use of metacognition and cognitive-monitoring, more importantly it was also noted that metacognition plays an important role in several intellectual facets including comprehension and problem solving (Flavell, 1979). Flavell concluded his discussion of the issue at hand with a call for the application of metacognitive training in formal educational settings in the future. Although one may conclude that this is the appropriate direction to take, more research is needed in this field in order to validate an approach that could be considered to be effective.

Approaches to Metacognitive Instruction

Perhaps before any arguments are asserted in favor of any one particular type of

metacognitive training, appropriate questions should be raised concerning whether or not any systematic attempt to change another's cognitions is a plausible task to undertake. One answer to this question was provided by Whimbey's (1980) work concerning the ways in which students can learn to be better problem solvers. An effective problem solver was described as one that uses a step-by-step approach to thinking about a problem while rechecking, reviewing, and rereading in order to avoid errors while overlooking nearly no detail (Whimbey, 1980). Although such processes described may seem to be hidden, and therefore unable to be manipulated, Whimbey (1980) disagreed. However, he also believed that somewhat popular, isolated courses in thinking skills are only a start and "attitudes and activities of analytical reasoning should be reinforced throughout the curriculum" in order to make students expert thinkers.

This call for a cross-curricular, integrated approach to the instruction of thinking skills raises a serious point of contention among educators and researchers alike. Although there appears to be general support by both groups concerned for improving instruction in thinking, there is less agreement on the best way to go about this endeavor. de Bono (1983), a leading proponent of the direct teaching of thinking as a skill, believed a specific place should be set aside in the curriculum so that it is recognized as a legitimate subject itself. He advocated the following evaluative approach for a design to follow in such a case of direct instruction of thinking strategies: the PMI Method. The PMI Method directs students to consider the Plus direction (good points), the Minus direction (bad points), and the Interesting direction (interesting things that might arise or are worth noting, even if they are neither good nor bad) in their thinking (de Bono, 1983). This approach contains one inherent weakness, as do several other direct approaches to strategies instruction, easily identifiable by its critics. Its' simplicity may incorrectly imply absolute generalizability. Many have disagreed with this assumption.

Bereiter (1984), one critic of such an approach, believed that it is not only necessary to make thinking a much needed part of regular instruction, but he also believes that teaching thinking as enrichment or as a separate subject is not usually successful (Bereiter, 1984). Developers of the "Learning to Learn" course at the University of Michigan offer data to repudiate such a claim as they attest to the course attributing to "substantial success in affecting students' self-reported study habits and modest success in affecting achievement in later semesters" (McKeachie, Pintrich, & Lin, 1985).

Another middle ground approach, which offers a direct teaching approach toward metacognitive strategies, but also applies these principles to the curriculum at hand, may serve as a viable option. The incorporation of these metacognitive objectives can be woven into the objectives concerned with the content, therefore making it a more integrated approach. Research conducted by Pokay and Blumenfeld (1990) offered some noteworthy advice for trying to incorporate this type of integrated approach into a high school classroom: their findings suggested that teachers should emphasize the use of content specific strategies early in the semester and general metacognitive strategies later. This way, students can effectively employ the appropriate strategies versus haphazardly, and often incorrectly, applying inappropriate strategies from their metacognitive repertoire. This more inductive model first focuses on specific strategies germane to the content at hand, and later guides the students through the process of synthesizing the strategies into a schema, which can be drawn upon in other learning situations.

Empirical Support for Metacognitive Instruction

Regardless of the approach taken, several research studies conducted in the area of metacognitive and study skills instruction have produced empirical data in support of this effort. Research conducted in the state of Michigan at three college institutions actually provided findings which clarified the inherent value within the

student who reports using a variety of metacognitive strategies (based on the MSLQ), even without a formal course in the area of thinking and learning strategies. Not only did these students who reported high usage of a variety of strategies do better on all performance measures employed by the researchers, but students who reported good use of study time were also found to have better grades in their classes, and on exams and labs (Pintrich, 1989).

There is also a great deal of data being reported as a result of the experimentation with the before mentioned "Learning to Learn" course at the University of Michigan. This introductory level psychology class took an interesting approach to the teaching of learning strategies. It applied the principles of cognitive psychology (specifically through the framework of the information-processing model) to provide a more theoretical approach to this type of instruction. Students in the course were not only taught how to study and learn, but why each method is considered effective based on the theoretical principles supporting the strategies being taught. Pintrich, McKeachie, and Lin (1987), a few of the primary developers of the course, reported that the essential areas of study included were learning from lectures, learning from reading, learning from discussions, learning from peers, cognitive models of memory and memory strategies, problem solving and creativity, self-management and time management, motivation and anxiety, and test-taking strategies.

The researchers decided to focus on test-taking strategies due to the belief that the performance deficits of anxious students may be the result of problems in either of the stages of encoding, storing/organizing, or retrieving of information (Pintrich, McKeachie, & Lin, 1987). This more cognitive than affective approach is then believed to allow for cognitive intervention in order to decrease anxiety-inducing thoughts during the exam situation which could impede the retrieval process. As hypothesized, the results of this course were shown to have more impact upon the achievement of high anxiety students as compared to others, as it was concluded that before the

intervention a great deal of these students were simply using rote memorization and excessive repetition instead of a variety of more effective study strategies (McKeachie, Pintrich, & Lin, 1985). Overall, it was concluded that the theoretically-based "Learning to Learn" course did have a slightly positive impact upon student achievement, however this more theoretical approach was found to be no more effective than a typical study skills course lacking in theoretical background (McKeachie, Pintrich, & Lin, 1985). Studies involving children in the first and second grades showed greater recall of information when given a more elaborate explanation for not only the use of mnemonic strategies, but also the benefits in doing so (Paris, Newman, & McVey, 1982). Perhaps this conclusion could imply that the explanation and justification for strategy use is more beneficial to younger children being exposed to these methods possibly for the first time.

Impact Upon Self-Efficacy

Another concluding assumption reached by the researchers involved with the University of Michigan studies is that as students developed thinking and learning skills, their self-efficacy and achievement would also improve (McKeachie, Pintrich, & Lin, 1985). Some attention has already been devoted to the consequences of the effective employment of learning strategies upon achievement, now the significance of the inclusion of an analysis of self-efficacy in the study must be examined.

This construct can be of paramount concern for educators when one considers how the perceived self-efficacy of a student can impact the motivation of a student not only to use strategies to learn, but their overall motivation to learn. Bandura and his colleagues have found that when presented with a difficult task, people with low expectancy beliefs give up, while, those with high self-efficacy beliefs exert greater effort to attain the goal at hand (Bandura & Schunk, 1981). Bandura and Schunk (1981) also found that self-efficacy and cognitive performance are enhanced when learners set attainable sub-goals that lead to a major goal, than focusing on the more

distant, broader goal. These strategies are not only descriptive of a learner with high self-efficacy, but also of a learner who employs metacognitive reasoning to a task at hand. This approach towards task analysis was incorporated into the treatment condition as a part of the before mentioned inductive approach to strategies instruction.

It was also necessary to incorporate other self-efficacy objectives into the treatment condition, considering that Palmer and Goetz (1988) reported that students had greater confidence in employing a new learning strategy acquired if they perceived that they had the required ability for effective use of the strategy at hand. Therefore, they asserted that whether or not a student used a new strategy introduced to them depended upon whether or not they thought they had the ability to use it properly.

Pintrich and DeGroot (1990) confirmed this link between self-efficacy and motivation to use new strategies by stating that students' involvement in self-regulated learning is closely tied to their efficacy beliefs concerning their ability to perform the task, and their belief that the activity is interesting and worthwhile; or students must have both the "will" and the "skill" to perform effectively. Further data was provided in linking self-efficacy with the use of metacognition. While further developing the MSLQ, and evaluating the effectiveness of the "Learning to Learn" course at the University of Michigan, data collected from these studies showed a moderate positive correlation of .61 between the scales of self-efficacy for learning and performance and metacognitive self-regulation (Pintrich et al., 1987). Yet one more reason educators may be concerned with the role of self-efficacy in learning is that several research studies have shown that the stronger the perceived self-efficacy of a learner, the higher the goals they set, and the stronger the commitment to them (Wood & Bandura, 1989).

Other Related Factors

Although a great deal of emphasis was placed upon self-report of metacognitive strategy usage and related impacts upon self-efficacy and achievement, a seemingly endless list of other related variables could have also been analyzed. One area of

further analysis was within the realm of gender differences among data collected. Research conducted in this field by Zimmerman and Martinez-Pons (1990) revealed that among participating students in grades five, eight, and eleven, girls reported using more self-regulated learning strategies like record keeping, monitoring, environmental structuring, and goals setting, despite reporting lower verbal self-efficacy results. These measures can be quite alarming, considering measures of strategy usage have typically been found to correlate with both achievement and academic self-efficacy (Zimmerman & Martinez-Pons, 1990). The question then becomes if girls truly are using more metacognitive strategies, then why are they not incorporating this usage positively into their self-efficacy for learning?

Yet another factor of interest was the help seeking scale component assessed by the MSLQ. Newman (1991) argued that even though a self-regulating learner may appear to be self-sufficient, they do seek help but in adaptive ways capable of acquiring successful results while restricting questions to necessary situations and then posing them in the most effective manner possible. This may not always be aimed toward the teacher, but help may be requested from knowledgeable peers as well. One feature found to discriminate high from low achievers is that the high achievers tended to seek academic assistance from those who were capable of helping (Zimmerman & Martinez-Pons, 1990).

The purpose of this study was to examine the impact of employing integrated metacognitive instruction on male and female high school students' achievement, self-efficacy, and test-anxiety. Although data exists concerning the effectiveness of such instruction at the college level, more empirical support was needed to confirm the effectiveness of such instructional methods at the high school level. Based upon existing research, one would expect to find a significant difference between the reported usage of metacognitive and study skills strategies between the treatment and control groups as reported by the data collected in the final administration of the MSLQ.

As the treatment class did report a significantly higher usage of learning and study strategies, a number of comparisons were made with data acquired through both achievement tests concerning academic performance, and the MSLQ self-report results concerning strategy usage and self-efficacy for learning. It was anticipated that the acquisition of a repertoire of learning and study strategies could possibly equip a student with more confidence concerning ones ability to perform well on academic ventures, while also improving ones actual academic performance. Therefore, it was hypothesized that:

1. The treatment group would score higher than the control group on the achievement test.

2. The treatment group would report higher self-efficacy scores than the control group on the MSLQ.

3. The treatment group would report lower test anxiety scores than the control group on the MSLQ.

4. Females would report higher levels of metacognitive strategy usage than males on the MSLQ.

5. Males would report higher self-efficacy scores than females on the MSLQ.

METHOD

A quasi-experimental design was employed in this research. Two classes that were taught by the researcher, a convenience sample, were selected from a secondary high school. A treatment condition and a control condition were randomly assigned to each class. Students in the treatment condition received four months of metacognitive and study skills instruction along with content curriculum. Students in the control condition received traditional content instruction only.

This design allowed for a better means of comparison between the geography class exposed to the metacognitive and study skills instruction as compared to the control classroom with a typical content-based curriculum. Several comparisons were made between these groups using data collected through the multiple administrations of the MSLQ, as well as the use of a computer generated content-based achievement tests administered at the beginning and the end of the semester.

Research in the field of metacognition and self-regulated learning has also noted some interesting relationships with cognitive and metacognitive strategy usage and both self-efficacy and test-anxiety. Both self-efficacy and test-anxiety are cognitive and emotional processes which can either greatly facilitate or greatly hinder the learning process. Therefore, both were also considered in this research project. Data concerning perceived self-efficacy for learning and performance, as well as reported levels of test-anxiety, were acquired using the MSLQ.

Subjects

The study was conducted in a large, suburban high school composed of approximately 2,000 students in grades nine through twelve. The school contains students from approximately seven neighboring communities, which vary in both ethnic and socioeconomic dimensions.

The participants in the study were enrolled in two advanced geography classes within the school in which the project investigator serves as the instructor. Both classes

contained high school sophomores who were considered to be advanced in their studies, and who have proven to be successful in previous advanced level social studies courses. The students ranged from approximately fourteen to sixteen years in age. One class contained 18 students and the other 22 students, therefore bringing the total number of students involved to 40. Of these 40 students 17 were male (42.5%), and 23 were female (57.5%).

Materials

The Motivated Strategies for Learning Questionnaire (See attachments) was administered to asses the students' use of different learning strategies for the geography course, as well as their beliefs about their ability to succeed in the course and their anxiety about tests in the course. This self-report instrument was developed to evaluate the effectiveness of a "Learning to Learn" class at the University of Michigan (McKeachie, Pintrich, & Lin, 1985). The MSLQ consists of fifteen different scales falling under either the category of the motivation or learning strategies section. Ten of theses scales, primarily found in the learning strategies section, were employed in this research study. Students were asked to respond to a total of 55 items. Internal reliability coefficients for the various scales measured ranged from .52 to .93 (Pintrich et al., 1987). The scale correlations with final grades in the "Learning to Learn" course were found to be significant, although moderate, but indicated predictive validity. Additional confirmatory factor analyses conducted by the developers of the MSLQ showed construct related validity.

Achievement was measured by scores attained on an objective test generated by a random selection of test questions from a computer based test bank accompanying the advanced geography textbook in use (See attachments).

Evidence of the treatment condition has also been provided through lesson plans (See attachments). Although each lesson plan varied by its specific application to the content at hand, each contained similar overriding objectives: Students will increase

their self-efficacy for learning and lower their test anxiety throughout the increased usage of metacognitive strategies such as rehearsal, elaboration, organization, critical thinking, self-regulation, effort regulation, peer learning, and help seeking.

Procedures

Students were informed (via an opening statement concerning the questionnaire employed) that participation in the educational testing component of the study was completely voluntary and had no impact upon the grade of the student. The student was also informed that early withdrawal from the study would incur no penalties. All educational tests were administered by a colleague in order to remove the project investigator from the testing situation. The return of a parental permission slip indicated the subject's consent to participate in this study.

Students willing to participate were administered the Motivated Strategies for Learning Questionnaire (MSLQ) at the beginning of the semester. For each item, students rated themselves on a seven point Likert scale from "not at all true of me" to "very true of me". Scale scores were constructed by taking the mean of all items that made up that scale. After an analysis of the data, the instructor provided students with feedback from the questionnaire concerning such components as their perceived self-efficacy for learning, their reported levels of test anxiety, as well as their level of employment of effective cognitive, metacognitive, and resource management strategies for studying and learning as applied to the course in which they are enrolled: advanced geography. After an initial assessment of functioning was made, an intervention was introduced in an attempt to foster a variety of metacognitive and study skills strategies. The MSLQ was again administered at both the middle and the end of the semester in order to allow the researcher to evaluate the effectiveness of this integrated approach at teaching metacognitive and learning strategies. Not only did the researcher then asses whether or not the students were reporting more frequent employment of effective metacognitive and study skills strategies, an analysis of the possible benefits

from such an increased awareness and usage of these strategies was also made.

The students in this study had already been assigned to the advanced geography classes for the fall semester. A random assignment was used to decide which class of the two convenience samples received the treatment condition (learning strategies instruction), and which class served as the control group (no change to subject curriculum).

Participants completed both the MSLQ scales and the achievement tests in their classroom during their classroom time. The questionnaire took approximately fifteen to twenty minutes to administer. The questionnaire was administered to both classes three times over the course of the fall semester (September 1999-January 2000), by a colleague, in the classroom of the project investigator. The content-based achievement test was administered at the beginning of the semester as a pre-test, and at the conclusion of the semester as a post-test.

All data collected was treated confidentially. All students willing to participate in the study were immediately assigned an identification number. Throughout the entire research project, all data was collected, calculated, and analyzed only with the use of identification numbers for sorting and appropriate comparisons to be made. Only the project investigator maintained a list in which names could be matched to personal identification numbers. This matching only occurred at the conclusion of the study when the student was provided with appropriate feedback concerning their use of learning and study strategies. Feedback was provided to the students concerning their score on the MSLQ scales, as well as the class' scale means. Each feedback form provided the student with a description of the scale along with suggestions on how to increase their levels of motivation and strategy use. The researcher anticipates repeating the treatment condition with the students previously in the control group even though the instruction was found to have only a moderate level of beneficial effects.

RESULTS

The impacts of treatment conditions and gender on achievement, metacognitive self-regulation, test-anxiety, and self-efficacy were examined by a repeated measure of multiple analysis of variance. The means and standard deviations of both gender groups' pre and post-test measures on achievement, metacognitive self-regulation, test-anxiety, and self-efficacy were reported in Table 1. There was no significant interaction between the treatment conditions, the time effect, and gender, F (4,33) = 1.98, $p > .05$, nor was there a significant interaction between the time effect and gender, F (4,33) = 1.03, $p > .05$. There was no significant interaction between the time effect and treatment conditions, F (4,33) = .782, $p > .05$, or between the treatment conditions and gender, F (4,33) = .383, $p > .05$.

However, there was a significant difference between treatment and control groups on the aggregated multiple measures of achievement, metacognitive self-regulation, test-anxiety, and self-efficacy, F (4,35) = 2.2, $p < .05$, one tailed. There was also a significant time effect compared by pre and post measures of the aggregated multiple measures of achievement, metacognitive self-regulation, test-anxiety, and self-efficacy, F (4,35) = 35.57, $p < .001$.

The follow up univariate analyses compared the treatment and control groups separately on the variables of achievement, metacognitive self-regulation, test-anxiety, and self-efficacy, and revealed that the treatment group had a significantly higher level of usage on the metacognitive self-regulation skill compared to the control group, F (1,38) = 7.67, $p < .01$. However, there was no significant difference found between the treatment and control groups on the other aspects of achievement, test-anxiety, and self-efficacy, F (1,38) = .08, $p > .05$, F (1,38) = .20, $p > .05$, and F (1,38) = 1.55, $p > .05$, respectively.

Table 1

Comparing Treatment Conditions and Gender Groups on Pre and Post Measures of Achievement, Metacognitive Self-Regulation, Test Anxiety, and Self-Efficacy.

	Mean (SD)					
	Treatment			Control		
	Male	Female	Overall	Male	Female	Overall
Achievement						
Pre Measure	24.6 (4.42)	18.9 (2.85)	21.7 (4.63)	23.1 (4.76)	21.4 (3.93)	22.0 (4.23)
Post Measure	31.2 (4.60)	29.1 (4.00)	30.2 (4.30)	32.4 (7.01)	27.2 (4.19)	29.1 (5.81)
Metacognition						
Pre Measure	4.6 (.56)	5.0 (.48)	4.8 (.54)	4.12 (.51)	4.4 (.50)	4.3 (.51)
Post Measure	4.5 (.63)	5.2 (4.2)	4.9 (.62)	4.1 (1.00)	4.5 (.52)	4.4 (.74)
Test-Anxiety						
Pre Measure	3.8 (1.00)	4.4 (.77)	4.1 (.93)	3.9 (1.10)	4.2 (.62)	4.1 (.81)
Post Measure	3.2 (.58)	4.4 (.69)	3.8 (.86)	3.7 (1.02)	4.3 (.57)	4.1 (.81)
Self-Efficacy						
Pre Measure	5.0 (.63)	4.9 (.36)	5.0 (.50)	5.0 (.73)	4.8 (.88)	4.8 (.82)
Post Measure	5.5 (.49)	5.0 (.46)	5.2 (.51)	5.0 (1.00)	4.7 (1.04)	4.8 (1.00)

While the treatment effect was consistent with those reported previously, analysis of between group factors revealed a significant difference between males and females on the aggregated multiple measures of achievement, metacognitive self-regulation, and test-anxiety, F (4,33) = 5.64, $p < .01$. The follow up univariate analyses compared males and females separately on the variables of achievement, metacognitive self-regulation, test-anxiety, and self-efficacy, and revealed significant differences on all these measures except self-efficacy, F (1,36) = 7.90, $p < .01$; F (1,36)

= 6.52, $p < .05$; and F (1,36) = 1.03; $p < .01$; and F (1,36) = 1.26, $p > .05$, respectively. These analyses revealed that males scored higher than females on the achievement test, females reported higher levels of metacognitive strategy usage than males, and females reported higher levels of test-anxiety than males.

The follow up univariate analyses on the within group factor of time, compared by pre and post measures, indicated that achievement was the only aspect that contributed to the significance of the above multiple analysis of variance. The post measure of achievement was significantly higher than that of the pre measure, F (1,38) = 137.9, $p < .001$. No significant improvements were found for the variables of metacognitive self-regulation, test-anxiety, and self-efficacy, F (1,38) = .38, $p > .05$; F (1,38) = .89, $p > .05$; and F (1,38) = 1.87, $p > .05$, respectively.

Although the directions of most of the measures were consistent with the ones that were hypothesized, as seen from Figure 1 through Figure 4, an analysis of variance and covariance on each of the post measures of achievement, metacognition, test-anxiety, and self-efficacy, using the corresponding pre measure as covariates, did not reveal any significant difference between the groups, F (1,37) = .99; $p > .05$, F (1,37) = .56; $p > .05$, F (1,37) = 1.3, $p > .05$; and F (1,37) = 2.4, $p > .05$, respectively.

Figure 1
Achievement

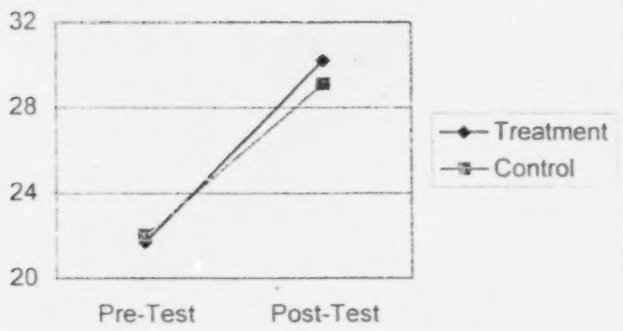


Figure 2
Metacognition

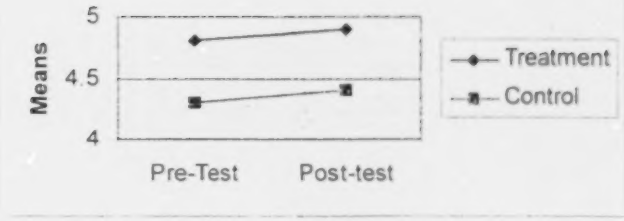


Figure 3
Test-Anxiety

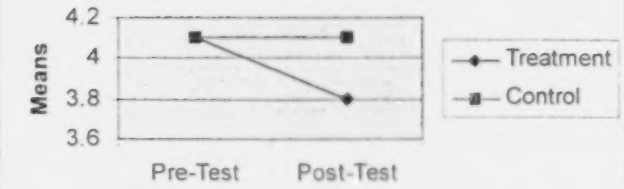
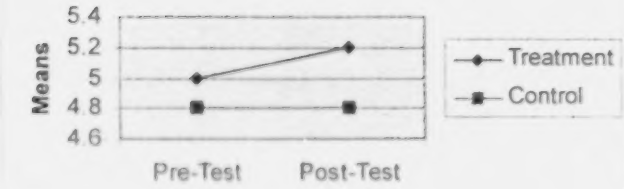


Figure 4
Self-Efficacy



When comparing scores obtained on the pre and post measures of achievement, Figure 1 displays a greater increase, although not significant, in the treatment condition in comparison to the control condition.

Figure 2 displays graphically the treatment group reported a significantly higher level of usage of skills than the control group in the post-test. However, Figure 2 also

displays the disparity between pre-test levels of metacognitive usage between conditions. The pre-test measures indicated that the treatment condition had a higher mean, as compared to the control mean, prior to the introduction of the treatment condition also.

It is evident in Figure 3 that the control condition reported no change in test-anxiety levels at the beginning and the end of the study. A decrease in test-anxiety levels can be observed within the treatment group.

The self-efficacy of the control group remained steady, as seen in Figure 4, while the treatment group increased from the pre measure to the post measure.

Figure 5
Achievement

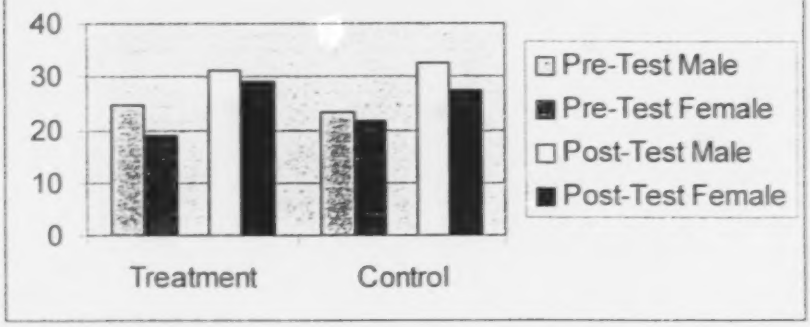


Figure 6
Metacognition

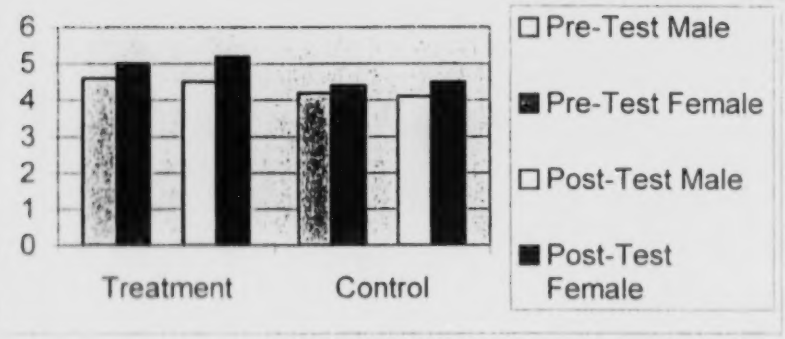
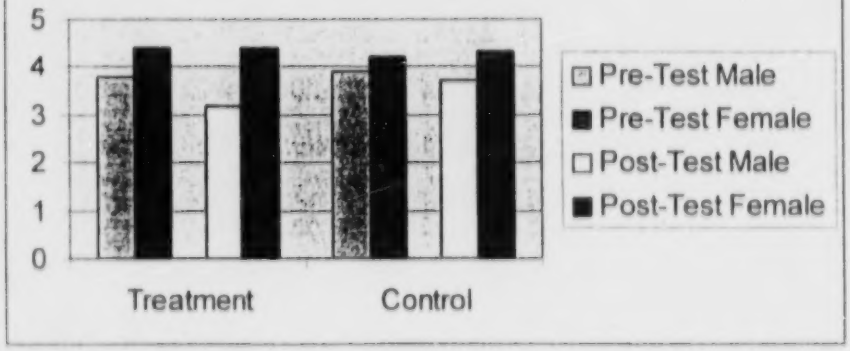


Figure 7
Test-Anxiety



DISCUSSION

Based on quantitative data collected and analyzed, the findings of this study did not confirm the hypothesized relationships between the treatment and control conditions, on the variables of achievement, metacognitive self-regulation, test-anxiety and self-efficacy. While there was no significant interaction between the treatment conditions and the time effect, univariate analyses compared the treatment and control groups separately on these variables and revealed that the treatment group only displayed a significantly higher level of usage of metacognitive self-regulation compared to the control group. However, there was no significant difference found between the treatment and control groups on the other aspects of achievement, test-anxiety, and self-efficacy.

This higher level of reported usage of metacognitive self-regulation by the treatment group, however, cannot be contributed to the treatment. Although the treatment condition displayed significantly higher levels of metacognitive strategy usage, the treatment group also displayed higher levels of metacognitive self-regulation at the start of the research project, as indicated by their pre-test results. This is why an analysis of variance and covariance between treatment and control groups on the usage of metacognitive self-regulation, using the pre-test as a covariate, did not reveal any significant differences.

However, this overall higher level of metacognitive strategy usage reported by the treatment group led the researcher to imply that the treatment group should have also displayed higher levels of achievement, lower levels of test-anxiety, and higher levels of self-efficacy, if the originally hypothesized relationships concerning the impact of metacognition on these related variables was to be upheld. A less empirically stringent approach towards the data showed, that although statistical significance was lacking, the data confirmed that the results were in the direction earlier anticipated. The marginal means of the conditions showed a slightly higher level of improvement

between pre and post measures of achievement within the treatment group. Other simple comparisons made between the marginal means of the conditions showed a previously mentioned higher level of usage of metacognitive self-regulation by the treatment group, a slight decrease in the level of test-anxiety within the treatment group, as compared to a constant level of anxiety reported by the control group, and slightly higher levels of self-efficacy within the treatment group as compared to the control group. Although these patterns can be seen, this study was unable to confirm these hypothesized relationships statistically. This is largely due to the small power of this research caused by the small effect size and the small size of the sample.

One area in which several significant relationships were discovered was within the analysis of the variable of gender. Gender was an area in which the researcher had hypothesized females would report higher usage of metacognitive strategies than males, while males would report higher levels of self-efficacy than females, based on previous findings discussed within the literature review (Zimmerman and Martinez-Pons, 1990). The results of this study showed that females scored significantly lower than males on the achievement test, while reporting significantly higher levels of metacognitive strategy usage. To further complicate this matter, females also reported significantly higher levels of test-anxiety.

Previously cited research conducted in this field by Zimmerman and Martinez-Pons (1990) revealed similarly alarming results. Their studies showed that among participating students in grades five, eight, and eleven, girls reported using more self-regulated learning strategies like record keeping, monitoring, environmental structuring, and goals setting, despite reporting lower verbal self-efficacy results. Even though the females involved within this study did not show significantly lower levels of self-efficacy, their mean scores were slightly lower overall. However, these measures are even more alarming when considering measures of strategy usage are typically correlated with both achievement and academic self-efficacy (Zimmerman & Martinez-Pons, 1990).

Not only did the females within this study not apply their higher level of strategy usage to the perceived self-efficacy, but also, this higher usage did not lead to higher achievement scores, as compared to males, nor did it lessen levels of test-anxiety among these girls. The question then becomes if girls truly are using more metacognitive strategies, then why are they not incorporating this usage positively into their self-efficacy for learning, or equipping them to more confidently tackle the task of test-taking?

The findings also indicated another relationship that was explored, and that was discovered to be significant, between the variables of help-seeking and self-efficacy for learning. Previously cited research explored the role of help-seeking in the self-regulated learner and within the low and high achieving student. Newman (1991) argued that even though a self-regulating learner may appear to be self-sufficient, they do seek help but in adaptive ways capable of acquiring successful results. These students also restrict questions to necessary situations, and then pose them in the most effective manner possible, while aiming them toward either the teacher, or a knowledgeable peer. One feature found to discriminate high from low achievers is that the high achievers tended to seek academic assistance from those who were capable of helping (Zimmerman & Martinez-Pons, 1990).

This study further indicated that there is also a positive relationship between help-seeking and self-efficacy for learning. This relationship suggested that help-seeking behaviors, then function as a healthy aspect of metacognition that may contribute to higher self-efficacy formation for those students who seek help from knowledgeable and appropriate sources. However, more research is needed in this area to clarify the somewhat ambiguous results found in this study.

Although another significant relationship was discovered between the post measures of achievement and self-efficacy, other variables previously found to be significantly correlated within the development and implementation of the MSLQ, i.e.

metacognitive self-regulation and self-efficacy, were not discovered. Again, sample size limitations may have played a role in this lack of significance encountered.

The implications from this research suggest that an integrated approach to metacognitive and study skills instruction within a high school curriculum may have a slightly positive impact upon achievement, metacognitive strategy usage, levels of test-anxiety, and self-efficacy for learning. However, the lack of statistical significance encountered within the study would call for several modifications within the replication of this intervention.

Perhaps the benefits of a more direct instructional approach are more powerful. Also, sample size considerations must be of paramount importance. If such modifications could be accounted for, stronger results could lead to a call for more implementation of such metacognitive and study skills instruction within the high school curriculum. A direct class focusing objectives pertaining to the variables at hand may be beneficial. The time involved within the instruction of this course may also alter the outcomes of the implementation of this instruction, where a longer treatment condition could contribute to a stronger effect size. While the research project at hand was unable to find significant treatment and control group differences over the course of four months, a full year course may be helpful for the students enrolled. It would also be very necessary for application of such instruction to pay special attention to the significant relationships encountered between gender and achievement, metacognitive self-regulation, levels of test-anxiety in this particular study.

Various weaknesses within the study also contributed to the lack of significance encountered, and would also need to be considered in the application or replication of this research project. The primary factor inhibiting the power of the data at hand was the small sample size used within the study. Although this particular research could not exhibit control over sample size, future studies that can account for a larger sample size are necessary in order to truly test the validity of the hypotheses. However, it should

also be noted that the advanced level of the students involved within the study could have also contributed to the difficulties encountered in showing a truly beneficial treatment effect. An instructor could have a very difficult time improving upon metacognitive strategy usage if he or she is dealing with advanced students that may be employing such strategies at a consistently high level to begin with, again making room for improvement difficult to discover. Perhaps, the benefits of such instruction may be more appropriate, and visible with a group of lower achieving students.

The inherent problems within using a convenience sample also affected the outcome of this project. While, overall, the treatment and control groups appeared to be relatively equal in their academic abilities (as evidenced by their pre-test measurements) the initial levels of metacognitive strategy usage, and the initial reports of self-efficacy of the treatment group were higher than those of the control group at the start of the research project. This factor led to difficulty in showing significant improvement levels between groups when considering their initial levels of functioning.

The inherent weaknesses of using the self-report method also contributed to the limitations within the study. Although the MSLQ did report reasonable levels of reliability and validity, there is truly no way to know exactly how much the metacognitive strategies were being employed by the students involved. Perhaps future studies in this area may further incorporate the feedback activities employed within this project in order to enhance more accurate self-reports. More consistent feedback concerning self-report results from the MSLQ given at the beginning, middle, and the end of the study would allow other relationships to be explored. Would this lead to greater improvement of strategy usage, and how would this feedback contribute to reported self-efficacy and test-anxiety levels? The impact of the role of feedback needs to be addressed in future studies.

This self-report method is also a crucial element to consider when comparing the significant interactions found between gender and the MSLQ scales of metacognitive

strategy usage and test-anxiety. Perhaps socialization differences between males and females could have contributed to the significant differences encountered within the analyses of the results. Or, in other words, did the females truly experience more test-anxiety that the males, or did they just feel that admitting to this level of anxiety was more socially appropriate than a similar response than the male students? Did the females truly use more metacognitive strategies, or did the males feel more inhibited in responding to this scale, as the gender roles attached to this behavior could have reinforced such a response? Perhaps, a more holistic approach in future research may provide some answers to these questions raised concerning gender.

Overall, future research is definitely necessary in order to gain more insight into the alarming results encountered concerning gender. First, it may be necessary for the study to be conducted within another subject matter. The spatial element of the required skills needed in order to perform successfully within the geography curriculum could possibly be a factor worthy of consideration, as the differences found within achievement levels of males and females are in need of further explanation. Also, future research concerning the self-efficacy formation within females may provide more insight into why females in this study reported more metacognitive strategy usage without internalizing this strength into a higher self-efficacy for learning. Further investigation is also needed in the area of gender differences between reported levels of test-anxiety. Why would females report higher levels of test-anxiety, if they were reporting higher test-preparation type metacognitive strategies? Perhaps, the previously reported lower levels of achievement scores among females could further compound this problem.

CONCLUSION

Overall, the findings of this study indicated that metacognitive and study skills instruction may display a slight, but not significant, positive impact upon achievement, metacognitive strategy usage, test-anxiety levels, and self-efficacy for learning of high school students. However, the benefits of such instruction may not transfer evenly among male and female students, as it was discovered that females reported higher levels of metacognitive strategy usage without transferring the benefits of this usage to the other variables of achievement, test-anxiety, or self-efficacy for learning.

This research, therefore, identified a need for more attention to be devoted to gender concerns within these academic processes. When one considers the positive impact that self-efficacy can have on all other aspects of learning, the study provides an even stronger impetus for further research in this area among other high school students, paying particular attention to gender and sample size. The results from this study can be applied and replicated, with the use of the MSLQ, with other students in large, suburban high schools.

In summary, the data did not confirm the hypotheses, but the results should not be discounted. There were many indicators to support the benefits of metacognitive and study skills instruction. Even with a lack of strong empirical data over the course of the semester, equipping students with more knowledge in this area may lead to more long-term benefits throughout a student's educational career. The feedback students acquired from the research project may also serve as yet another tool for fostering metacognition in students as they are given the opportunity to assess and evaluate their self-reported levels of, metacognition, test anxiety, and self-efficacy learning. Also, it is imperative that the results of this study be used in order to attempt to close the obvious gender gap encountered in this particular facet of education.

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Lesson Plans

Goal: Students will become active, self-regulating learners who employ effective strategies for learning and remembering that are consistent with the information-processing model.

Procedure: Incorporate learning objectives one through seven into the established curriculum for advanced geography.

Methods:

*Presentation of Information-Processing Model (Raforth, 1993)

*Experiments with long versus short term memory-Numbers and Chunking

*What was your earliest memory and why? Activity-Meaningful Learning

*Discuss examples of selective memory/selective attention

*Informal test for dominant mode of learning-Audio, Visual, Tactile

*Experiment with visualization/elaboration-Grocery List

(Objectives/Procedures #1-#7 were adapted from suggestions included in the student feedback forms from the MSLQ.)

Objective 1: Expectancy for Success

Students will improve their perceptions of potential success in the course and their self-confidence for understanding the course content.

Procedure: Evaluate your current approach to an assignment by figuring out what you are doing right, what you are doing wrong, and how you can change your approach to be more successful. A better understanding of the way you learn, what works, and what does not work, may increase your confidence in doing well in this course.

Methods:

*Personal Characteristics for Learning Survey (Weinstein & Hume, 1998)

*Variables to Consider for Successful Learning (Weinstein & Hume, 1998)

*Fist to five method in which students display between 0 to five fingers to indicate feedback on comprehension and understanding

Objective 2: Test Anxiety

Students will decrease their overall anxiety by developing better study strategies.

Procedure: Prepare well for class and try to complete assignments on time. Try not to wait until the last minute to get things done or to get ready for an exam. When taking a test, concentrate on one item at a time, and if you are stumped on a question, move on and go back to the question later. Remind yourself that you have prepared well and if you cannot answer some questions, it is ok, you will still be able to answer the others.

Methods:

*Introduce strategies for reducing test anxiety (Raforth, 1993)

*Complete survey after tests for reflection and evaluation of preparation strategies

Objective 3: Rehearsal

Students will increase their usage of strategies such as rereading class notes and course readings and memorizing lists of key words or concepts effectively.

Procedure: List the important terms and topics in the course. Define them and repeat them out loud. Break up the list into smaller lists that are made up of closely related items. Make up images or rhymes to help you remember those lists. Generate test items to help you measure your recall.

Methods

*Introduce rehearsal strategies (Weinstein & Hume, 1998)

*Introduce key word strategy-Overhead (Raforth, 1993)

*Develop class mnemonics-MR. HELP

*Develop the use of flash card

Objective 4: Elaboration

Students will increase their usage of strategies such as summarizing or paraphrasing (putting into your own words) the materials they read in their textbook, and relating the material to what they already know or have learned.

Procedure: Paraphrase and summarize important information. Use your own words to describe the material covered during the lecture or in assigned reading. Pretend you are the teacher and trying to explain the topic to other students! Try to figure out how each topic relates to each other. What are the connections between what you have heard in lecture, talked about in discussion, or read in the book?

Methods:

*Introduce elaboration strategies (Weinstein & Hume, 1998)

*Model strategy of drawing pictures for explanation and elaboration

*Introduce activities of role-playing

Objective 5: Organization

Students will increase their usage of strategies such as selecting the main ideas from readings and organizing and putting together what is needed to learn in this course.

Procedure: Outline course material and identify where the text and lecture overlap. This will give you a starting point in developing connections between ideas presented in two different contexts. Make chart, diagrams, or tables of the important concepts. Something like a flow chart or a tree diagram is usually very helpful in trying to understand how different ideas "go together".

Methods:

*Tic-tac-toe example

*Organization of closet example

*Outlining tips and strategies (Sheinker & Sheinker, 1989)

*Introduce organizational strategies (Weinstein & Hume, 1998)

*Model organization with skeleton outlines for presentations

*Introduce note-taking strategies (Raforth, 1993)

Objective 6: Metacognition

Students will think more often about what they are reading or studying while they do their schoolwork.

Procedure: Skim the reading material before you begin to see how it is organized. Look at the headings and subheadings of the text to give yourself an idea of how things are related to each other. While reading, ask yourself questions about the paragraph you have just read and record key word in a notebook. Try to determine which concepts you do not understand well. Although this method takes longer initially, you are more likely to remember what you have read. This saves time later when studying for a test.

Methods:

*Pre/During/Post Activity Thinking Strategies-Handout (Weinstein & Hume, 1998)

*Introduce metacognitive questions to consider (Weinstein & Hume, 1998)

*Pre/During/Post Assignment Thinking Strategies-Handout (Weinstein & Hume, 1998)

*My Strategic Plan-Handout (Weinstein & Hume, 1998)

*Employ self-testing strategies

*Journal reflections

*PMI (Plus, Minus, Interesting) (de Bono, 1983)

*Introduce active reading strategies (Sanacore, 1984)

*Paraphrasing with peers

Objective 7: Self-Effort

Students will increase their willingness to try hard on school work, even when the work is difficult.

Procedure: Keep a list of topics that you find yourself procrastinating about instead of studying for. Try to analyze why you postpone studying these topics by discussing them with other students. Talking with them may lead you to consider an approach that may help you act more quickly instead of delaying studying the material.

Methods:

*Study Schedule-Handout (Weinstein & Hume, 1998)

*Group activity-Write out questions about material to be answered in groups

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Motivated Strategies For Learning Questionnaire(MSLQ)[1]

1	2	3	4	5	6	7
not at all true of me						very true of me

Expectancy Component: Self-Efficacy for Learning and Performance

1. I believe I will receive an excellent grade in this class.
2. I'm certain I can understand the most difficult material presented in the readings for this course.
3. I'm confident I can understand the basic concepts taught in this course.
4. I'm confident I can understand the most complex material presented by the instructor in this course.
5. I'm confident I can do an excellent job on the assignments and tests in this course.
6. I do not expect to do well in this class. (REVERSED)
7. I'm certain I can master the skills being taught in this class.
8. Considering the difficulty of this course, the teacher, and my skills, I think I will do well in this class.

Affective Component: Test Anxiety

9. When I take a test I do not think about how poorly I am doing compared with other students. (REVERSED)
10. When I take a test I do not think about items on other parts of the test I can't answer. (REVERSED)
11. When I take a test I think of the consequences of failing.
12. I have an uneasy, upset feeling when I take an exam.
13. I feel my heart beating fast when I take an exam.

Cognitive and Metacognitive Strategies: Rehearsal

14. When I study for this class, I practice saying the material to myself over and over.
15. When studying for this class, I read my class notes and the course readings over and over again.
16. I memorize key words to remind me of important concepts in this class.
17. I make lists of important terms in this course and memorize the lists.

Cognitive and Metacognitive Strategies: Elaboration

18. When I study for this class, I pull together information from different sources, such as lectures, readings, and discussions.
19. I try to relate ideas in this subject to those in other courses when possible.
20. When reading for this class, I try to relate the material to what I already know.
21. When I study for this course, I write brief summaries of the main ideas from the readings and the concepts from the lectures.
22. I try to understand the material in this class by making connections between readings and the concepts from the lectures.
23. I try to apply ideas from course readings in other class activities such as lecture and discussion.

Cognitive and Metacognitive Strategies: Organization

24. When I study the readings for this course, I outline the material to help me organize

my thoughts.
25. When I study for this course, I go through the readings and my class notes and try to find the most important ideas.
26. I make simple charts, diagrams, or tables to help me organize course material.
27. When I study for this course, I go over my class notes and make an outline of important concepts.

Cognitive and Metacognitive Strategies: Critical Thinking
28. I often find myself questioning things I hear or read in this course to decide if I find them convincing.
29. When a theory, interpretation, or conclusion is presented in class or in the readings, I try to decide if there is good supporting evidence.
30. I treat the course material as a starting point and try to develop my own ideas about it.
31. I try to play around with ideas of my own related to what I am learning in this course.
32. Whenever I read or hear an assertion or conclusion in this class, I think about possible alternatives.

Cognitive and Metacognitive Strategies: Metacognitive Self-Regulation
33. During class time I often miss important points because I'm thinking of other things. (REVERSED)
34. When reading for this course, I make up questions to help focus my reading.
35. When I become confused about something I'm reading for this class, I go back and try to figure it out.
36. If course materials are difficult to understand, I change the way I read the material.
37. Before I study new course material thoroughly, I often skim it to see how it is organized.
38. I ask myself questions to make sure I understand the material I have been studying in this class.
39. I try to change the way I study in order to fit the course requirements and instructor's teaching style.
40. I often find that I have been reading for class but don't know what it was all about. (REVERSED)
41. I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying.
42. When studying for this course I try to determine which concepts I don't understand well.
43.When I study for this class, I set goals for myself in order to direct my activities in each study period.
44. If I get confused taking notes in class, I make sure I sort it out afterwards.

Resource Management Strategies: Effort Regulation
45. I often feel so lazy or bored when I study for this class that I quit before I finish what I planned to do. (REVERSED)
46. I work hard to do well in this class even if I don't like what we are doing.
47. When course work is difficult, I give up or only study the easy parts. (REVERSED)
48. Even when course materials are dull and uninteresting, I manage to keep working until I finish.

Resource Management: Peer Learning

49. When studying for this course, I often try to explain the material to a classmate or friend.
50. I try to work with other students from this class to complete course assignments.
51. When studying for this course, I often set aside time to discuss the course material with a group of students from the class.

Resource Management: Help Seeking

52. Even if I have trouble learning the material in this class, I try to do the work on my own, without help from anyone. (REVERSED)
53. I ask the instructor to clarify concepts I don't understand well.
54. When I can't understand the material in this course, I ask another student in the class for help.
55. I try to identify students in the class whom I can ask for help if necessary.

[1]Pintrich, P.R., McKeachie, W.J., Smith, D.A., Doljanac, R., Lin, Y.G., Naveh-Benjamin, M., Crooks, T., & Karabenick, S. (1987). The motivated strategies for learning questionnaire (MSLQ). Ann Arbor, MI: NCRIPTAL, The University of Michigan.

Dear Parent/Guardian,

Your child's instructor is conducting a study concerning teaching and learning strategies, in cooperation with Miami University. She would like to ask for permission for your child's participation in the study. As part of the study, students will be asked over the course of the semester to fill out questionnaires related to their motivation and learning in their advanced geography class. If they participate, they will receive feedback on their learning skills and motivation that may be useful for remainder of their high school and possibly their college career. Throughout the course of the school year, students will receive instruction concerning study skills and learning strategies to enhance academic performance. The purpose of the questionnaires to be completed by the students is to evaluate the effectiveness of such instruction. It is anticipated that the students will effectively employ a variety of study strategies while lowering test anxiety and raising self-confidence for academic success.

YOUR CHILD'S PARTICIPATION IS VOLUNTARY AND NOT RELATED IN ANY WAY TO HIS/HER GRADE IN THIS CLASS. Students may decide to participate now with parental permission, but they can withdraw from the study at any time during the course of the semester with no penalty. All of the responses are strictly confidential and only the project investigators will see their individual responses.

The questionnaire to be issued (Motivated Strategies for Learning Questionnaire) will ask about study habits, learning skills, and motivation for work in this course. **THERE ARE NO RIGHT OR WRONG ANSWERS.** Students will be asked to respond to the questions as accurately as possible, reflecting their own attitudes and behaviors in this course. Responses will be analyzed and students will receive an individual report in several weeks. The individual report will help to identify motivation and learning skills that students may want to improve upon during the year. Additionally, the instructor will receive feedback on the class as a whole, which will allow her to tailor the course to class needs. Your signature on the appropriate line at the bottom of this form indicates your willingness to provide permission for your child's participation in this study. Thank you for your consideration and cooperation.

NAME OF STUDENT:(PLEASE PRINT)_____

Yes, I grant my son/daughter permission to participate in the study.

_____

No I do not grant my son/daughter permission to participate in the study.

_____

PLEASE FEEL FREE TO CALL THE INSTRUCTOR WITH ANY PERTINENT QUESTIONS OR CONCERNS:

MRS. BARBARA A. HIGGINS, SOCIAL STUDIES INSTRUCTOR
PRINCETON HIGH SCHOOL (513) 552-8397

MOTIVATED STRATEGIES FOR LEARNING QUESTIONNAIRE

Your instructor is conducting a study concerning teaching and learning strategies, in cooperation with Miami University. She would like to ask for your participation in the study. As part of the study, over the course of the semester you will be asked to fill out several questionnaires related to your motivation and learning in this class. If you participate, you will receive feedback on your learning skills and motivation that may be useful to the remainder of your high school and possibly your college career. **YOUR PARTICIPATION IS VOLUNTARY AND NOT RELATED IN ANY WAY TO YOUR GRADE IN THIS CLASS.** You may decide to participate now but you can withdraw from the study at any time during the course of the semester with no penalty. All of your responses are strictly confidential and only the project investigators will see your individual responses.

The attached questionnaire asks you about your study habits, your learning skills, and your motivation for work in this course. **THERE ARE NO RIGHT OR WRONG ANSWERS.** Please respond to the questions as accurately as possible, reflecting your own attitudes and behaviors in this course. Your responses will be analyzed and you will receive an individual report in several weeks. The individual report will help you identify motivation and learning skills that you may want to improve upon during the year. Additionally, your instructor will receive feedback on your class as a whole, which will allow her to tailor the course to class needs. Your completion of the questionnaire indicates your willingness to participate in this study. Thank you for your consideration and cooperation.

NAME (PLEASE PRINT)_____

PERIOD_____

ID #_____

ACHIEVEMENT TEST

PART 2: POPULATION PATTERNS AND PROCESSES

CHAPTER 4. FUNDAMENTALS OF POPULATION GEOGRAPHY

MULTIPLE-CHOICE QUESTIONS

1. In the 1990s scientists warned that the world could face a global food crisis as a result of continued population growth and changing eating habits, especially the higher consumption of:
   a. dairy products
   b. meat
   c. rice
   d. fish

2. The greatest single concentration of the world's population is located in East Asia adjacent to the Pacific Ocean from Korea to Vietnam and centered on:
   a. Japan
   b. Taiwan
   c. China
   d. the Philippines

3. Over large parts of Bangladesh the rural population density is between _?_ people per square mile.
   a. 1000 and 1500
   b. 2000 and 3000
   c. 3000 and 5000
   d. 5000 and 8000

4. The populations of South America, Africa, and Australia, combined, barely exceed that of what country alone?
   a. Japan
   b. China
   c. India
   d. Indonesia

5. South America could probably sustain far more than its present population if:
   a. more of the Rain Forest were cleared
   b. better hybrids were available
   c. more fertilizer were available
   d. reforms in land ownership and use could take place

CHAPTER 5. PROCESSES AND CYCLES OF POPULATION CHANGE

MULTIPLE-CHOICE QUESTIONS

6. Today, the highest overall population growth is on the continent of:
   a. Africa
   b. Asia
   c. South America
   d. Australia

7. If a population increases by a uniform amount during a series of equal time periods, the increase is said to be:
   a. linear
   b. compounded
   c. exponential
   d. modest

8. Every rate of growth, including population growth, has a *doubling time* which is the time it takes a population to double in size. If a population is growing at an average rate of 2 percent, its doubling time would be _?_ years.
   a. 20
   b. 25
   c. 30
   d. 35

9. Population structure for a given country is visually represented by an age-sex pyramid, and a population with a broad-based pyramid is a population with both:
   a. a high percentage of women and children in the population
   b. high fertility and low mortality rates
   c. low fertility and high mortality rates
   d. high fertility and high mortality rates

10. Before 1750 death rates in Europe probably averaged 35 per 1000, but by 1850 the death rate was about 16 per 1000. This meant that in 1750 the doubling time was on the order of 150 years but by 1850 it was only _?_ years.
   a. 50
   b. 75
   c. 35
   d. 25

CHAPTER 6. MIGRATION AND ITS CAUSES

MULTIPLE CHOICE QUESTIONS

11. The perception of direction is a relative concept that often is based upon older usage, perhaps even from another culture. For example, the terms "Near East" (Turkey, Egypt, Libya), "Middle East" (Iraq and the Persian Gulf), and the "Far East" (the East Asian realm) are directions as viewed from:

a. Paris
b. Berlin
c. Rome
d. London

12. Refugees are officially recognized as displaced persons only after they:

a. apply for the classification
b. travel 100 miles from their homes
c. cross an international boundary
d. have been displaced for one year

13. Cross-border refugee flows create enormous problems for:

a. the country which they fled
b. families they left behind
c. host countries
d. relatives in the country to which they fled

14. By 1990, the United States had accepted nearly _?_ Vietnamese refugees.

a. 900,000
b. 700,000
c. 500,000
d. 300,000

15. In 1995, the collapse of which of the following European countries produced the largest refugee crisis in Europe since the end of World War II?

a. Turkey
b. the former Yugoslavia
c. Greece
d. Romania

CHAPTER 7. ROUTES OF HUMAN MOBILITY

MULTIPLE-CHOICE QUESTIONS

16. The great majority of Europeans who migrated to Middle and South America came from:
a. Spain and Portugal
b. England and Germany
c. Poland and Italy
d. France and Belgium

17. External migrations did not involve just Europeans. The British moved large numbers of indentured Indian laborers as well, and in so doing substantially changed the ethnic mosaic of:
a. East Asia
b. Western Europe
c. eastern Africa from Kenya to the Cape of Good Hope
d. western Africa

18. In Southeast Asia, where ethnic Chinese constitute a relatively small percent of the population, some countries have limited their immigration because they:
a. smuggle narcotics into the countries
b. have too much influence on Southeast Asian culture
c. buy all the good farm land
d. are urban-based and influential in trade and finance

19. In the late 1890s, the flow of internal Russians to the east of the Ural mountains was greatly strengthened by:
a. a new government land program
b. establishment of freer movement within the country
c. the construction of the Trans-Siberian Railroad
d. the construction of numerous military bases

20. The United States Census Bureau divides the United States into four regions. For more than three decades two of these regions have lost population. These two are the:
a. South and Midwest
b. West and Midwest
c. Northeast and Midwest
d. South and Northeast

PART 3: THE GLOBAL LINGUISTIC MOSAIC

CHAPTER 8. A GEOGRAPHY OF LANGUAGES

MULTIPLE-CHOICE QUESTIONS

21. Elephants and dolphins have forms of sound communication, but only humans have developed ? that change over time and space.
    a. gestures that convey meaning
    b. complex vocal communication systems
    c. symbolic calls
    d. nonverbal means of communication

22. Some scholars argue that the quality of the "standard" language of a society is:
    a. a result of education
    b. affected by the age of the population
    c. unchanging over time
    d. a matter of cultural identity and national concern

23. The continent with the most languages is probably:
    a. Africa
    b. Europe
    c. North America
    d. Australia

24. Languages that are thought to have a shared, but fairly distant origin, are grouped in language ? .
    a. subfamilies
    b. families
    c. groups
    d. sets

25. The most widely spoken Chinese dialect is:
    a. Wu Chinese
    b. Mandarin Chinese
    c. Cantonese
    d. Peekenese

CHAPTER 9. THE DIFFUSION OF LANGUAGES

MULTIPLE-CHOICE QUESTIONS

26. The Romance languages of today are derived from:
a. Greek
b. Latin
c. Sanskrit
d. Etruscan

27. According to the *agricultural hypothesis* of the spread of the Proto-Indo-European language, the source region was in present-day:
a. Russia
b. France
c. Turkey
d. Egypt

28. The final stages of the dispersal of the older languages that took place before the global diffusion of English and other Indo-European languages occurred in the:
a. black African realm
b. Pacific realm and the Americas
c. South Asian realm
d. Northwest European realm

29. English is a member of the __?__ subfamily of languages.
a. Romance
b. Germanic
c. Slavic
d. Celtic

30. By two thousand years ago certain languages had successfully diffused over entire subcontinents. Particularly notable were Chinese and:
a. Sanskrit
b. Latin
c. English
d. Greek

CHAPTER 10. MODERN LANGUAGE MOSAICS

MULTIPLE-CHOICE QUESTIONS

31. One reason that Hispanics could argue for the recognition of Spanish as the *de facto* second language of the United States is the:
a. unique regional concentration of Hispanics
b. high numbers of Hispanics
c. economic position of Hispanics
d. cultural contribution of Hispanics

32. Early in the twentieth century, a major effort was launched to create a world language called:
a. Esperanto
b. Creole
c. Etruscan
d. Pidgin

33. In which region of the Western Hemisphere did contact between English speakers and peoples speaking African languages result in the development of a *pidgin* language:
a. the Caribbean
b. Central America
c. the American South
d. southern South America

34. Which of the following European countries has a rather sharp division between Flemish speakers in the north and those speaking Walloon in the south?
a. Netherlands
b. Belgium
c. Denmark
d. Andorra

35. When African colonies became independent countries, one of the first acts of many of the new governments was to:
a. conduct a census
b. build a new capital city
c. change the names of places that had been named after colonial figures
d. build new road systems

PART 4: THE GEOGRAPHY OF RELIGION

CHAPTER 11. THE ORIGIN AND DISTRIBUTION OF RELIGIONS

MULTIPLE-CHOICE QUESTIONS

36. Which of the following religions have developed vast bureaucracies?
    a. Christianity and Islam
    b. Buddhism and Islam
    c. Hinduism and Shintoism
    d. Animism and Buddhism

37. One problem in determining the membership figures for different religions is that:
    a. some countries do not include religious membership in their census figures
    b. religious membership figures are often kept secret
    c. developing countries do not take any census counts
    d. census data is often both undependable and suffers from definitional problems

38. The largest constituency of Christianity is:
    a. Protestant
    b. Eastern Orthodox
    c. Coptic
    d. Roman Catholicism

39. Buddhism has its source in:
    a. India
    b. Japan
    c. China
    d. Thailand

40. Which of the following is **not** one of the true global religions of today?
    a. Hinduism
    b. Christianity
    c. Islam
    d. Buddhism

CHAPTER 12. RELIGION: LOCATION, DIFFUSION, AND CULTURAL LANDSCAPE

MULTIPLE-CHOICE QUESTIONS

41. Hinduism has not spread by expansion diffusion in modern times, but at one time it did spread by relocation diffusion as a result of:
    a. the transportation of Indian workers abroad during the colonial period
    b. conquest by militant groups
    c. forced relocation by Islamic invaders
    d. massive voluntary emigration

42. The location of shrines in Hinduism is important because:
    a. they must be handy for worship
    b. they can only be made from local stone
    c. there should be minimal disruption of the natural landscape
    d. they must be built under an old tree

43. As Buddhism diffused to other lands, it lost ground in its source country which was:
    a. Afghanistan
    b. India
    c. Sri Lanka
    d. Indonesia

44. The oldest religion to emerge west of the Indus valley is Judaism which emerged about:
    a. 500 B.C.
    b. 1000 B.C.
    c. 2000 B.C.
    d. 3000 B.C.

45. Certain religious denominations have more durable cultural landscapes than others. In the United States the best example of this is the Mormon culture region. Another region is located in the:
    a. Northeast
    b. South
    c. Southwest
    d. Midwest

CHAPTER 13. RELIGION, CULTURE, AND CONFLICT

MULTIPLE-CHOICE QUESTIONS

46. In Nigeria today the __?__ religion has the greatest number of adherents.
a. Christian
b. Islamic
c. animistic
d. Sikh

47. Which of the following African countries is **not** one that straddles Africa's transition zone between Islam and non-Islam?
a. Chad
b. Sudan
c. Ethiopia
d. Congo

48. The rise of fundamentalism is a phenomenon that seems to afflict:
a. Islam
b. Islam and Christianity
c. Hinduism and Islam
d. virtually all religions

49. When the former Soviet Union came into being, the Soviet communists determined to make __?__ state out of their country.
a. an atheistic
b. a Christian
c. a Muslim
d. a secular

50. In Northern Ireland today, about what percent of the population is Protestant?
a. 66
b. 50
c. 30
d. 25

Feedback Form: Motivated Strategies for Learning Questionnaire

Motivation: Expectancy for Success

This is a measure of your perceptions of your potential success in this course and of your self-confidence for understanding the course content. A high score means that you think you will do well in this course, and feel confident that you will be able to master the course material.

Your score: _____

Class mean: _____

Bottom 25%: _____

Top 25%: _____

Suggestions: Evaluate your current approach to a course assignment from different points of view. For example, describe the effectiveness and ineffectiveness of your approach from your own perspective. Then imagine how a classmate might evaluate your approach. By analyzing the way you are tackling an assignment, you may be able to figure out what you're doing right and what you're doing wrong and can change your approach. A better understanding of the way you learn, what works and what doesn't work, may help increase your confidence in doing well in this course.

Feedback Form: Motivated Strategies for Learning Questionnaire

Test Anxiety

This is a measure of how much you worry about tests and how often you have distracting thoughts when you take an exam. In contrast to other scales, a high score here means you are anxious in testing situations.

Your score: _____

Class mean: _____

Bottom 25%: _____

Top 25%: _____

Suggestions: Developing better study skills usually results in less anxiety. Prepare well for class and try to complete assignments on time. Try not to wait until the last minute to get things done or to get ready for an exam. Doing this should help build your confidence at test time and hopefully reduce test anxiety. When taking a test, concentrate on one item at a time, and if you're stumped on a question, move on and go back to the question later. Remind yourself that you've prepared well and if you can't answer some questions, it's ok, you'll still be able to answer the others.

Feedback Form: Motivated Strategies for Learning Questionnaire

Cognitive Strategy: Rehearsal

This scale is a measure of how often you use study strategies such as rereading class notes and course readings and memorizing lists of key words and concepts. A high score means you use these strategies fairly often.

Your score: _____

Class mean: _____

Bottom 25%: _____

Top 25%: _____

Suggestions: List the important terms and topics in the course. Define them and repeat them out loud. Break up that list into smaller lists that are made up of closely related items. Make up images or rhymes to help you remember those lists. Generate test items to help you measure your recall.

Feedback Form: Motivated Strategies for Learning Questionnaire

Cognitive Strategy: Elaboration

This scale reflects how often you attempt to summarize or paraphrase (put into your own words) the material you read in your textbooks, and how often you try to relate the material to what you already know or have learned. A high score means that you use these strategies fairly often. These strategies usually result in better performance than rehearsal strategies.

Your score: _____

Class mean: _____

Bottom 25%: _____

Top 25%: _____

Suggestions: Paraphrase and summarize important information. Use your own words to describe the material covered during lecture or in assigned reading. Pretend you're the teacher and are trying to explain the topic to students! Try to figure out how each topic relates to each other. What are the connections between what you've heard in lecture, talked about in discussion, read in the book?

Feedback Form: Motivated Strategies for Learning Questionnaire

Cognitive Strategy: Organization

This scale refers to your ability to select the main ides from your readings as well as your attempts to organize and put together what you need to learn in this course.

Your score: _____

Class mean: _____

Bottom 25%: _____

Top 25%: _____

Suggestions: Outline course material and identify where the text and lecture overlap and don't overlap. This will give you a starting point in developing connections between ideas presented in two different contexts. Make charts, diagrams, or tables of the important concepts. Something like a flowchart or a tree diagram is usually very helpful in trying to understand how different ideas "go together".

Feedback Form: Motivated Strategies for Learning Questionnaire

Metacognition

This is a measure of how often you think about what you are reading or studying as you do your school work. For example, do you monitor your attention while you read or do you often find that you have read 10 pages in your textbook and can't remember anything about it? Do you adjust your reading speed if you are reading something difficult in comparison to reading the newspaper? A high score means that you try to plan your work and check on whether you understand the course material.

Your score: _____

Class mean: _____

Bottom 25%: _____

Top 25%: _____

Suggestions: Skim the reading material before you begin to see how it is organized. Look at the headings and subheadings of the text to give yourself an idea of how things are related to each other. While reading, ask yourself questions about the paragraph you have just read and scribble key words in the margins of the book or in a notebook. Try to determine which concepts you don't understand well. Although this method takes longer initially, you are more likely to remember what you have read. This saves you time later when studying for a test.

Feedback Form: Motivated Strategies for Learning Questionnaire

Resource Management: Self-Effort

This scale refers to your willingness to try hard on your schoolwork, even when the work is difficult. A high score means that you try hard and exert effort in your studying.

Your score: _____

Class mean: _____

Bottom 25%: _____

Top 25%: _____

Suggestions: Keep a list of the topics that you find yourself procrastinating instead of studying for. Try to analyze why you postpone studying those topics by discussing them with other students. Talking with them may lead you to consider an approach that may help you to act more quickly instead of delaying studying the material.